ABSTRACT OF THE DISCLOSURE

The invention applies techniques for image reconstruction from X-ray diffraction patterns on the three-dimensional imaging of defects in EUVL multilayer films. The reconstructed image gives information about the out-of-plane position and the diffraction strength of the defect. The positional information can be used to select the correct defect repair technique. This invention enables the fabrication of defect-free (since repaired) X-ray Mo-Si multilayer mirrors. Repairing Mo-Si multilayer-film defects on mask blanks is a key for the commercial success of EUVL. It is known that particles are added to the Mo-Si multilayer film during the fabrication process. There is a large effort to reduce this contamination, but results are not sufficient, and defects continue to be a major mask yield limiter. All suggested repair strategies need to know the out-of-plane position of the defects in the multilayer.